

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

WATZ INA NAME

ROAD PLAN

SECTION 22, 23, 26, 27, 34, 35, TOWNSHIP 14 NORTH, RANGE 05 WEST, W.M.
LEWIS COUNTY

LEWIS DISTRICT

AGREEMENT NO.: 30-076349

CONTRACT ADMINISTRATOR: Scott Sargent

DATE: 05/01/2004

STAFF ENGINEER: Matthew T. Miskovic

DRAWN & COMPILED BY: Alicia Compton

SECTION 0 – SCOPE OF PROJECT

This project includes but is not limited to construction and optional construction including:

- clearing;
- grubbing;
- right-of-way debris disposal;
- excavation and/or embankment to subgrade;
- landing construction;
- acquisition and installation of drainage structures;
- acquisition, manufacture, and application of rock;
- grass seeding.

This project also includes but is not limited to reconstruction and optional reconstruction including:

- clearing existing excavation and embankment slopes;
- grubbing existing excavation and embankment slopes;
- right-of-way debris disposal;
- acquisition and installation of additional drainage structures;
- acquisition, manufacture, and application of rock;
- grass seeding.

This project also includes but is not limited to abandonment including:

- medium abandonment.

SECTION 1 - GENERAL CLAUSES

- 1.1-1
- Clauses in this plan apply to all construction, reconstruction, or abandonment including landings unless otherwise noted.
- 1.1-2
- Construction or reconstruction of the following roads is required. All roads shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
L-3000	110+45 to 228+05	Reconstruction
L-3016	0+00 to 14+61	Reconstruction
L-3016.1	0+00 to 7+94	Construction
L-3025	0+00 to 17+20	Reconstruction
L-3025 Ext.	0+00 to 19+73	Construction

1.1-3 Construction or reconstruction of the following roads is not required. Roads used by the Purchaser shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
L-3008	0+00 to 2+41	Reconstruction
L-3008	2+41 to 5+92	Construction
L-3014	0+00 to 8+00	Reconstruction
L-3014.1	0+00 to 3+31	Construction
L-3014.2	0+00 to 5+52	Construction
L-3015.1	0+00 to 8+80	Reconstruction
L-3015 Shoefly	0+00 to 2+46	Construction
L-3016	14+61 to 21+14	Reconstruction
L-3016.1	7+94 to 15+62	Construction
L-3025 Ext.	19+73 to 46+30	Construction

1.1-4 If the Purchaser desires a road location or design change, a revised Road Plan shall be submitted to the State for consideration.

1.1-5 On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.1-10 Abandonment of the following road is required. All roads shall be abandoned in accordance with this Road Plan.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
L-3008	0+00 to 5+92	Medium
L-3025 Ext.	30+50 to 46+30	Medium

1.1-11 On the following road, an assist vehicle may be required for loaded log trucks.

<u>Road</u>	<u>Stations</u>
L-3025 Ext.	31+50 to 37+00

1.2-1 The construction, reconstruction, or abandonment of any roads specified herein shall not be permitted between September 30 and May 1 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-2 Purchaser shall not use roads constructed or reconstructed under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-4 On the following roads, construction and reconstruction shall be completed by September 30, 2005.

<u>Road</u>	<u>Stations</u>
L-3025	0+00 to 17+20
L-3025 Ext.	0+00 to 19+73

- 1.2-6
Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator.
- Clearing and grubbing shall be completed prior to starting excavation and embankment.
- Culvert placement in live streams shall precede embankment where culverts are to be placed along natural ground.
- Culverts shall be installed in completed subgrade as construction progresses.
- Subgrade, ditches, and culvert installations shall be completed and are subject to written approval by the Contract Administrator prior to rock application and/or timber haul.
- 1.3-2
Hauling shall be suspended when wheel track rutting exceeds 6 inches unless Purchaser elects to correct the situation at his/her own expense. Corrective measures and continued operations are subject to written approval by the Contract Administrator.
- 1.4-3
Reference points (R.P.'s) that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said R.P.'s until all moved or damaged R.P.'s are reset.
- 1.5-1
Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

SECTION 2 - CLEARING

- 2.1-1
Fell all vegetative material larger than 2 inches DBH or over 5 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

SECTION 3 - GRUBBING

- 3-1
All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed.
- 3-2
Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

- 4.1-1
Right-of-way debris is defined as all nonmerchantable vegetative material larger than one cubic foot in volume within the grubbing limits.
- 4.1-2
All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.
- 4.2.3-1
Right-of-way debris shall be scattered outside the grubbing limits.
- 4.2.3-2
Right-of-way debris shall not be placed against standing timber.

SECTION 5 - EXCAVATION

5.1-1
Roads shall be constructed or reconstructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-3
Road grade and alignment shall conform to the State's marked location. Grade and alignment shall have smooth continuity without abrupt changes in direction. Maximum grades are: 18 percent favorable and 20 percent adverse. Minimum radius curve is 60 feet.

5.1-4
Minimum extra widening on the inside of curves shall be:

5 feet extra	80 to 100 foot radius curve
7 feet extra	60 to 80 foot radius curve

5.1-5
Curve widening, where required, shall be added to the inside of curves.

5.1-7
Roads shall be constructed or reconstructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

<u>Tolerance Class</u>	<u>A</u>	<u>B</u>	<u>C</u>
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8
Excavation slopes shall be constructed no steeper than shown on the following table:

<u>Material Type</u>	<u>Excavation Slope Ratio</u>
Common Earth (on side slopes of 55%)	1:1
Common Earth (55% to 70% sideslopes)	¾:1
Common Earth (on slopes over 70%)	½:1
Fractured or loose rock.....	½:1
Hardpan or solid rock.....	¼:1

5.1-9
Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-10
Embankments shall be widened as follows:

<u>Height at Centerline</u>	<u>Subgrade Widening</u>
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11
Embankment slopes shall be constructed no steeper than shown on the following table:

<u>Material Type</u>	<u>Embankment Slope Ratio</u>
Common Earth and Rounded Gravel.....	1½:1
Angular Rock.....	1¼:1
Sandy Soils	2:1

5.1-16
Turnout locations noted on this plan are approximate. Locations shall be adjusted to fit with final subgrade alignment and sight distances.

- 5.1-18
Turnarounds shall be no larger than 30 feet long and 30 feet wide. Location shall be subject to written approval of the Contract Administrator.
- 5.1.1-1
Waste material shall not be deposited within 50 feet of a cross drain culvert installation.
- 5.1.1-3
Waste material may be deposited adjacent to the road prism on side slopes up to 45 percent if the waste material is compacted and more than 100 feet away from live streams. On side slopes of 45 percent or more, all excavation shall be end hauled or pushed to designated embankment sites.
- 5.1.1-5
When constructing landings, waste material and embankment shall not be placed on side slopes steeper than 45%.
- 5.2-1
Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the grubbing limits, or restrict drainage.
- 5.3-1
All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts. Side hill embankments too narrow to accommodate excavation equipment may be placed by end-dumping or side casting until sufficiently wide to support the equipment.
- 5.4-1
Silt-bearing runoff shall not be permitted to go into streams.
- 5.4-2
Accomplish sediment removal through silt traps, silt fences, settling ponds, or other methods as approved, in writing, by the Contract Administrator.
- 5.4-3.1
On the following roads, Purchaser shall furnish and evenly spread the seed mixture listed below on all exposed soil inside the grubbing limits at a rate of 40 pounds per acre. The date of application is subject to approval by the Contract Administrator.

<u>Mixture Percent by Weight</u>	<u>Minimum Percent Germination</u>
50% Fescue, Red	90% Germination
25% Ryegrass, Perennial	90% Germination
15% Bentgrass	85% Germination
10% Clover, White and White Dutch (inoculated)	90% Germination

Weed seed shall not exceed 0.5% by weight.

Seed shall be furnished in standard containers on which the following shall be shown:

1. Common name of seed
2. Net weight
3. Percent of purity
4. Percentage of germination
5. Percentage of weed seed and inert material

Required seed not spread by the termination of this contract shall become property of the State.

<u>Road</u>	<u>Stations</u>	<u>Seed Quantity (lbs)</u>
L-3008	0+00 to 5+92	25
L-3014.1	0+00 to 3+31	15
L-3014.2	0+00 to 5+52	20
L-3015 Shoefly	0+00 to 2+46	10
L-3016.1	0+00 to 15+62	60
L-3025 Ext.	0+00 to 46+30	185

Constructed subgrades shall be compacted full width except ditch prior to rock application. Compaction shall be by a smooth-drum vibratory roller weighing at least 14,000 pounds. Four complete passes shall be made at a maximum operating speed of 3 mph.

- 5.5-5
Finished subgrade shall be crowned as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

SECTION 6 - DRAINAGE

- 6.2.1-1
Purchaser shall furnish, install, and maintain corrugated polyethylene pipe (AASHTO specification No. M-294 Type S) and on culverts over 24 inches, aluminized culverts (meeting ASTM A 819, AASHTO M-274 aluminized steel Type 2 and AASHTO M-36 specifications) as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

- 6.2.1-2
Manufacturer's approved connectors shall be used for corrugated polyethylene pipe.

- 6.2.1-4
The following culvert will be supplied by the State and is available from the stockpile at station 3+31 on the L-3014.1 road.

<u>Road</u>	<u>Stations</u>
L-3008	1+37

- 6.2.1-5
On required roads: culverts, downspouts, flumes, bands, and gaskets as listed on the CULVERT LIST which are not installed shall become property of the State.

- 6.2.2.1-1
Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the Corrugated Polyethylene Pipe Association "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."

- 6.2.2.3-1
Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low points of dips in roads shall not be skewed.

- 6.2.2.3-2
Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

- 6.2.2.5-1
Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

- 6.3-1
Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

- 6.4-1
Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

- 6.5-1
Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts except for temporary culverts.

SECTION 7 - ROCK

7.1-1
Rock for construction and/or reconstruction under this contract may be obtained from a source on State land as listed below at no charge to the Purchaser. Development and use shall be in accordance with a written "Development Plan" prepared by the State. A copy of the written plan is available upon request from the Pacific Cascade Region office. Upon completion of operations, the rock source shall be left in the condition specified in said plan, subject to approval by the Contract Administrator. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using or desire to use this rock source, a joint operating plan shall be developed. All parties shall follow this plan.

<u>Source</u>	<u>Location</u>
Quick Quarry	Sec. 35, T14N, R05W, W.M.

7.1-6
Rock for construction or reconstruction under this contract may be obtained from any commercial source as approved in writing by the Contract Administrator.

<u>Possible Source</u>	<u>Location</u>
Hope Creek Quarry	HWY 6, Doty WA

7.2.1-4
Rock shall meet the following specifications for gradation and quality. The exact point of evaluation for conformance to specifications will be determined by the Contract Administrator.

7.2.1.1-3	1 ½ INCH MINUS CRUSHED ROCK
	% passing 1 ½" square sieve..... 100%
	% passing 1" square sieve..... 70 - 90%
	% passing 5/8" square sieve..... 50 - 80%
	% passing ¼" square sieve..... 30 - 50%
	% passing U.S. #40 sieve..... 3 - 18%
	% passing U.S. #200 sieve..... 7.5% Max.

All percentages are by weight.

7.2.1.1-7	4 INCH MINUS ROCK
	% equal to, or smaller in one dimension than the specified size 100%
	% passing U.S. #40 sieve..... 16% Max.
	% passing U.S. #200 sieve..... 5% Max.

All percentages are by weight.

7.2.1.1-10	8 INCH PLUS ROCK
	% equal to, or larger in one dimension than the specified size 100%
	% passing U.S. #40 sieve..... 16% Max.
	% passing U.S. #200 sieve..... 5% Max.

All percentages are by weight.

7.2.1.1-12
Landing rock shall be no coarser than 6 INCH MINUS.

7.2.1.2-1

A minimum of 50% by weight of coarse aggregate shall have at least one fractured face. Coarse aggregate is the material retained on each specification sieve size ¼ inch and above, if that sieve retains more than 5% of the total sample.

7.2.3-1

Measurement of the 1 ½ INCH MINUS CRUSHED, 4 INCH MINUS, and 8 INCH PLUS rock shall be on a cubic yard truck measure basis. Each truck box shall be measured by the Contract Administrator prior to rock hauling. The Contract Administrator shall periodically require that a load be flattened off and its volume calculated. An average of such volumes for each truck shall be used to tally the volume to be hauled. The Purchaser shall provide and maintain load tally sheets for each truck and shall give them to the Contract Administrator upon request.

7.4.2-1

Apply at least the minimum required rock quantity as shown on the ROCK LIST. Required and optional rock shall meet the specifications on the ROCK LIST.

7.4.2-4

On the following roads, if hauling shall take place only from May 1 to September 30, Purchaser may not be required to place or provide the optional rock in the ROCK LIST. Purchaser shall then be required to submit a written plan for approval by the Contract Administrator describing how these roads shall be constructed, used, and abandoned in compliance with all other clauses in the ROAD PLAN.

<u>Road</u>	<u>Stations</u>
L-3008	2+41 to 5+92
L-3014.1	0+00 to 3+31
L-3014.2	0+00 to 5+52
L-3015.1	0+00 to 8+80
L-3016	14+61 to 21+14
L-3016.1	7+94 to 15+62

7.4.2-9

Turnarounds, turnouts, and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-10

Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-1

Rock shall be mixed, compacted, and graded in sections not to exceed ½ mile in length. Water shall be added in quantities to facilitate compaction. If directed by the Contract Administrator, a minimum of 6 gallons of water per cubic yard of rock shall be applied.

7.4.3-2

Rock shall be spread and compacted full width in lifts each not to exceed 15 inches uncompacted depth. Compaction shall be by pneumatic-tired or steel-wheeled smooth drum vibratory roller weighing at least 14,000 pounds. Four complete passes at a maximum speed of 3 mph shall be made on each lift.

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.2-1

Purchaser shall reduce or relocate landing debris, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

9.2-2

Purchaser shall provide for drainage of the landing surface as approved, in writing, by the Contract Administrator.

9.2-3

Landing embankments shall be sloped to original construction specifications.

SECTION 10 - ROAD AND LANDING ABANDONMENT

10.1-1

The following road shall be abandoned by the Purchaser at the termination of use.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
L-3008	0+00 to 5+92	Medium
L-3025 Ext.	30+50 to 46+30	Medium

10.1-3

Medium Abandonment shall consist of:

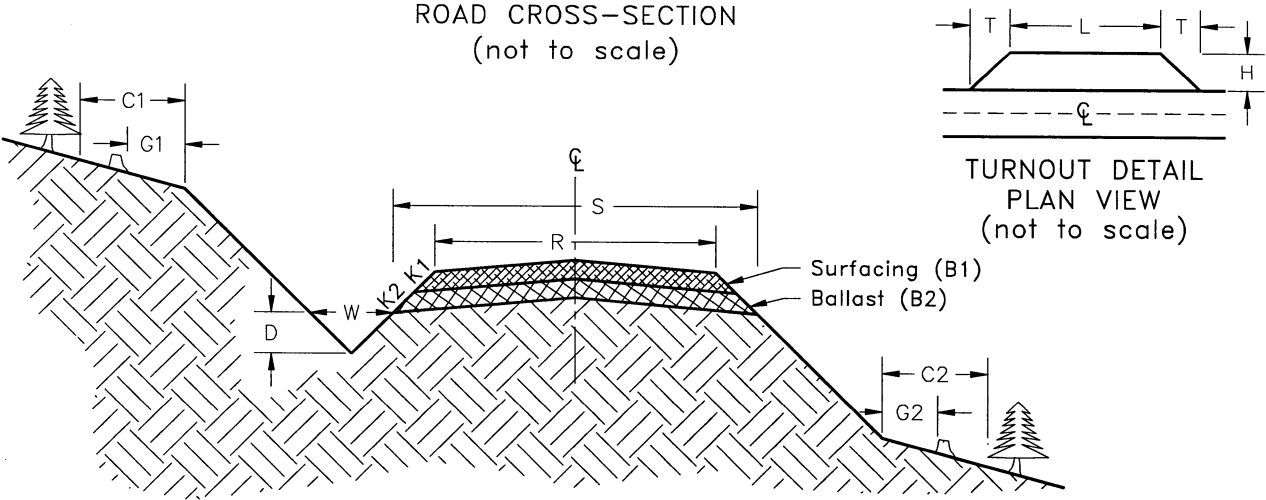
- work shall be performed between July 1 and September 30;
- ripping the surface to a minimum depth of 18 inches;
- constructing non-drivable water bars, as directed by Contract Administrator, in conformance with the attached NON DRIVABLE WATER BAR DETAIL at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 100 feet, or as marked in the field;
- skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;
- keying water bars into ditchline;
- construction of tank trap barriers in conformance with the attached "T" TANK TRAP DETAIL;
- removing culverts from State Land;
- removing ditch cross drain culverts and leaving the resulting trench open;
- sloping all trench walls and approach embankments no steeper than 2:1;
- grass seeding concurrently with abandonment and in accordance with Clause: 5.4-3.1;
- covering, concurrently with abandonment, all exposed soils within 100 feet of any live stream, with a 8 inch deep layer of straw.

10.1-7

On the following road, Purchaser shall remove culvert from live streams and leave the resulting trench open with excavation slopes consistent with Clause 5.1-8. Excavated material shall be placed in the waste area approved in writing by the Contract Administrator. Culvert removal from live streams shall be in accordance with the Hydraulic Project Approval, FILL REMOVAL DETAIL, SETTLING POND AND PUMP DETAIL, and the LIVE STREAM CULVERT REMOVAL PROCEDURE.

<u>Road</u>	<u>Stations</u>	<u>Waste Area</u>
L-3008	1+37	L-3008 @ 0+20 & 2+50

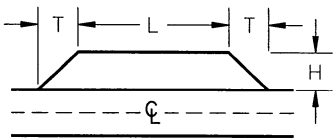
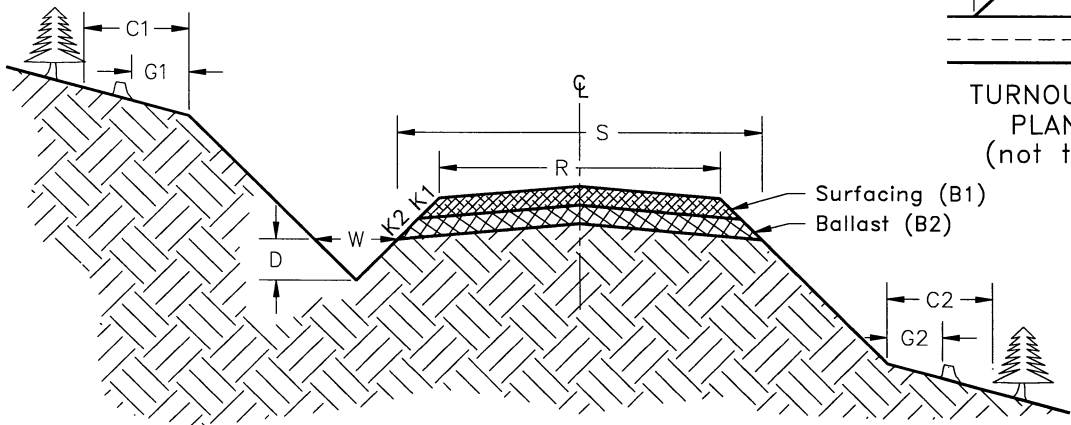
TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade Width	Road Width	Ditch		Crown in. @ CL	Grubbing Limits		Clearing Limits	
						Width	Depth		G1	G2	C1	C2
L-3000	110+45	228+05	C	16'	14'	-	-	4"	-	-	-	-
L-3008	0+00	5+92	C	12'	10'	2'	1'	4"	3'	3'	5'	5'
L-3014	0+00	8+00	C	13'	12'	-	-	4"	-	-	-	-
L-3014.1	0+00	3+31	C	12'	10'	2'	1'	4"	3'	3'	5'	5'
L-3014.2	0+00	5+52	C	12'	10'	2'	1'	4"	3'	3'	5'	5'
L-3015.1	0+00	8+80	C	12'	10'	2'	1'	4"	3'	3'	5'	5'
L-3015 Shoefly	0+00	2+46	C	17'	12'	3'	1'	4"	5'	5'	10'	10'
L-3016	0+00	21+14	C	13'	12'	-	-	4"	3'	3'	5'	5'
L-3016.1	0+00	15+62	C	12'	10'	2'	1'	4"	3'	3'	5'	5'
L-3025	0+00	17+20	C	13'	12'	-	-	4"	-	-	-	-
L-3025 Ext.	0+00	19+73	C	16'	12'	3'	1'	4"	5'	5'	10'	10'
	19+73	30+00	C	15'	12'	3'	1'	4"	5'	5'	10'	10'
	30+00	45+00	C	16'	12'	3'	1'	4"	5'	5'	10'	10'
	45+00	46+30	C	15'	12'	3'	1'	4"	5'	5'	10'	10'

ROCK LIST
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BALLAST

ROAD CROSS-SECTION
(not to scale)



TURNOUT DETAIL
PLAN VIEW
(not to scale)

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout		
									Length	Width	Taper
			K2	B2					L	H	T
L-3008	0+00	2+41	1 1/2:1	8"	34	2.41	82	Quick Quarry			
*	2+41	5+92	1 1/2:1	8"	34	3.51	119				
*	Landings (2)						100				
*L-3014.1	0+00	3+31	1 1/2:1	8"	34	3.31	113				
*	Landing (1)						50				
*L-3014.2	0+00	5+52	1 1/2:1	8"	34	5.52	188				
*	Landing (1)						50				
*L-3015.1	0+00	8+80	1 1/2:1	8"	34	8.80	299				
L-3015 Shoe-fly	0+00	2+46	1 1/2:1	12"	70	2.46	172				
*L-3016	14+61	21+14	1 1/2:1	8"	40	6.53	261				
*	Landing (1)						50				
L-3016.1	0+00	7+94	1 1/2:1	8"	34	7.94	270				
*	7+94	15+62	1 1/2:1	8"	34	7.68	261				
*	Landing (2)						100				
L-3025 Ext.	0+00	19+73	1 1/2:1	10"	56	19.73	1,105				
	19+73	30+00	1 1/2:1	10"	52	10.27	534				
	30+00	45+00	1 1/2:1	10"	56	15.00	840				
	45+00	46+30	1 1/2:1	10"	52	1.30	68				
	Landing (1)						50				
	Turnouts (3)			10"	56	3.00	168		50'	10'	50'
						8 INCH PLUS		Quick Quarry			
L-3014.2	Culvert installation						1				
L-3016	Culvert installations						2				
L-3016.1	Culvert installation						1				
L-3025 Ext.	Culvert installations						9				

*Optional rock according to clause 7.4.2-4.

REQUIRED 4 INCH MINUS TOTAL 3,289 Cubic Yards
OPTIONAL 4 INCH MINUS TOTAL 1,591 Cubic Yards
8 INCH PLUS TOTAL 13 Cubic Yards

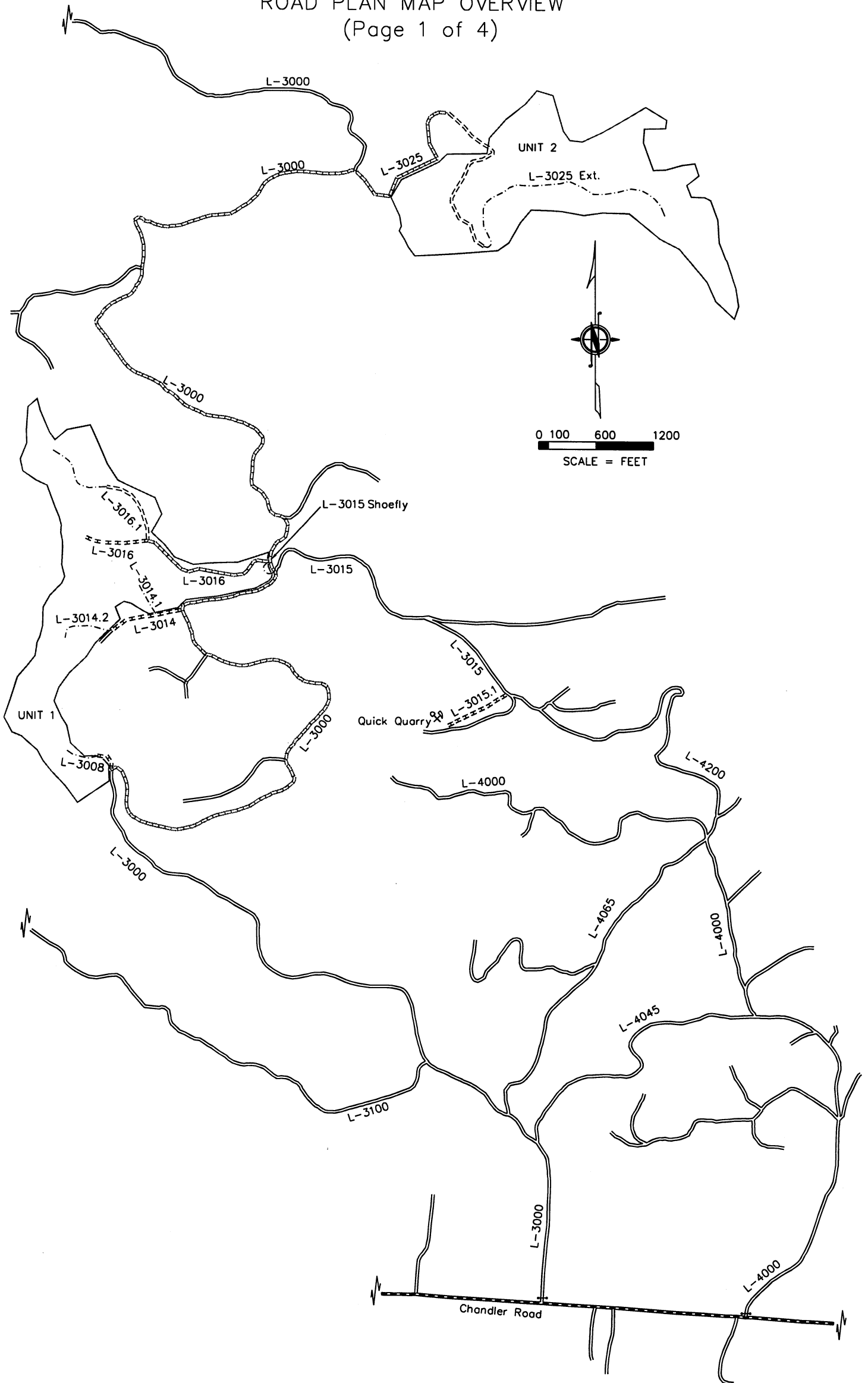
ROCK LIST
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SURFACE

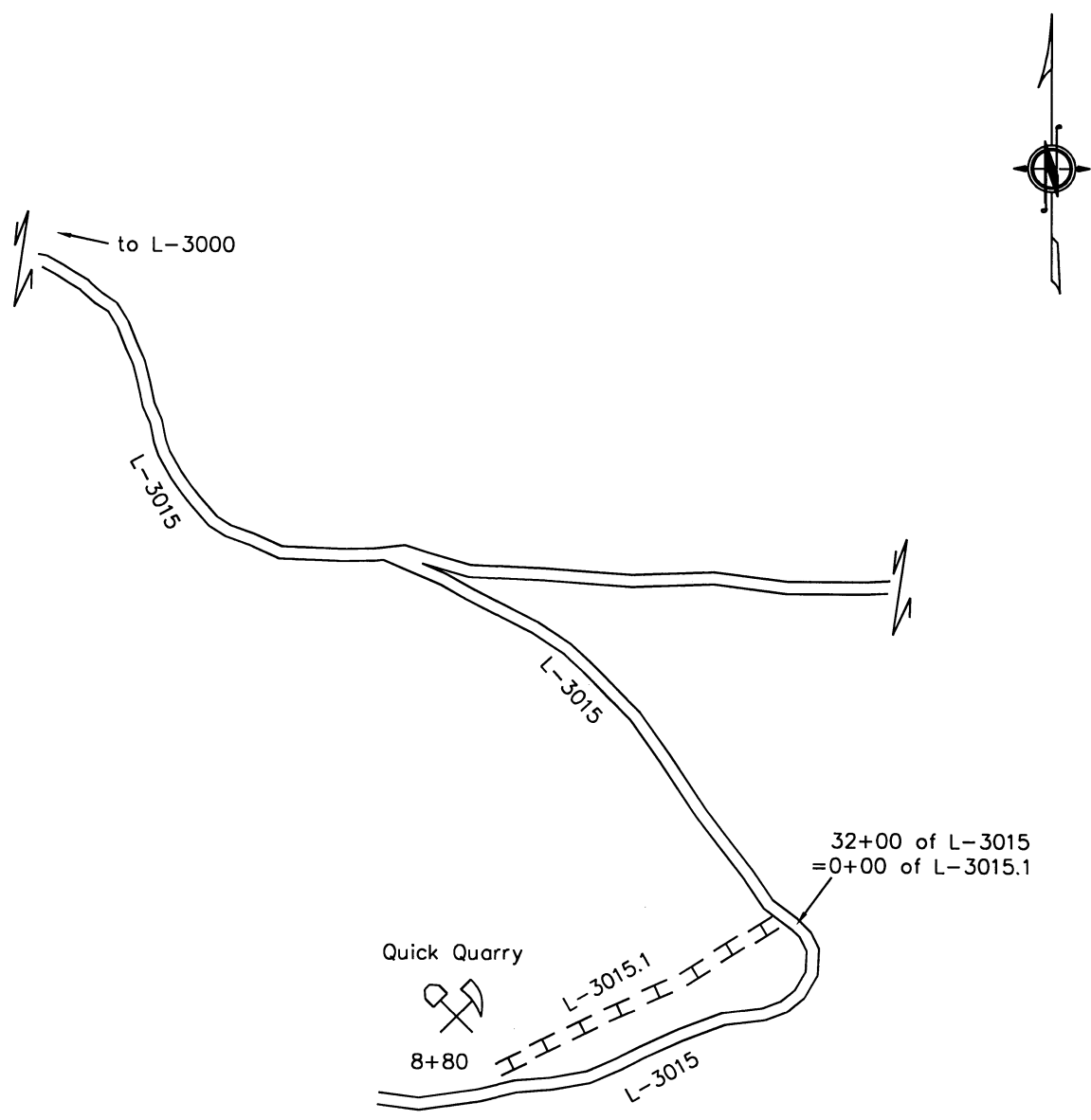
Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Total	Rock Source
			K1	B1				
L-3000	110+45	228+05	1 ½:1	6"	34	117.60	3,998	Quick Quarry or any commercial source
L-3014	0+00	8+00	1 ½:1	4"	19	8.00	152	
L-3015 Shoefly	0+00	2+46	1 ½:1	6"	30	2.46	74	
L-3016	0+00	14+61	1 ½:1	4"	19	14.61	278	
	Turnout						19	
L-3025	0+00	17+20	1 ½:1	4"	19	17.20	327	
L-3025 Ext.	0+00	19+73	1 ½:1	4"	19	19.73	375	
	30+00	45+00	1 ½:1	4"	19	15.00	285	
	Turnouts (2)		1 ½:1	4"	19	2.00	38	

1 ½ INCH MINUS CRUSHED TOTAL 5,546 Cubic Yards

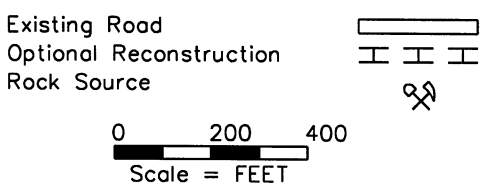
WATZ INA NAME
ROAD PLAN MAP OVERVIEW
(Page 1 of 4)



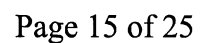
WATZ INA NAME
ROAD PLAN MAP
(Page 2 of 4)



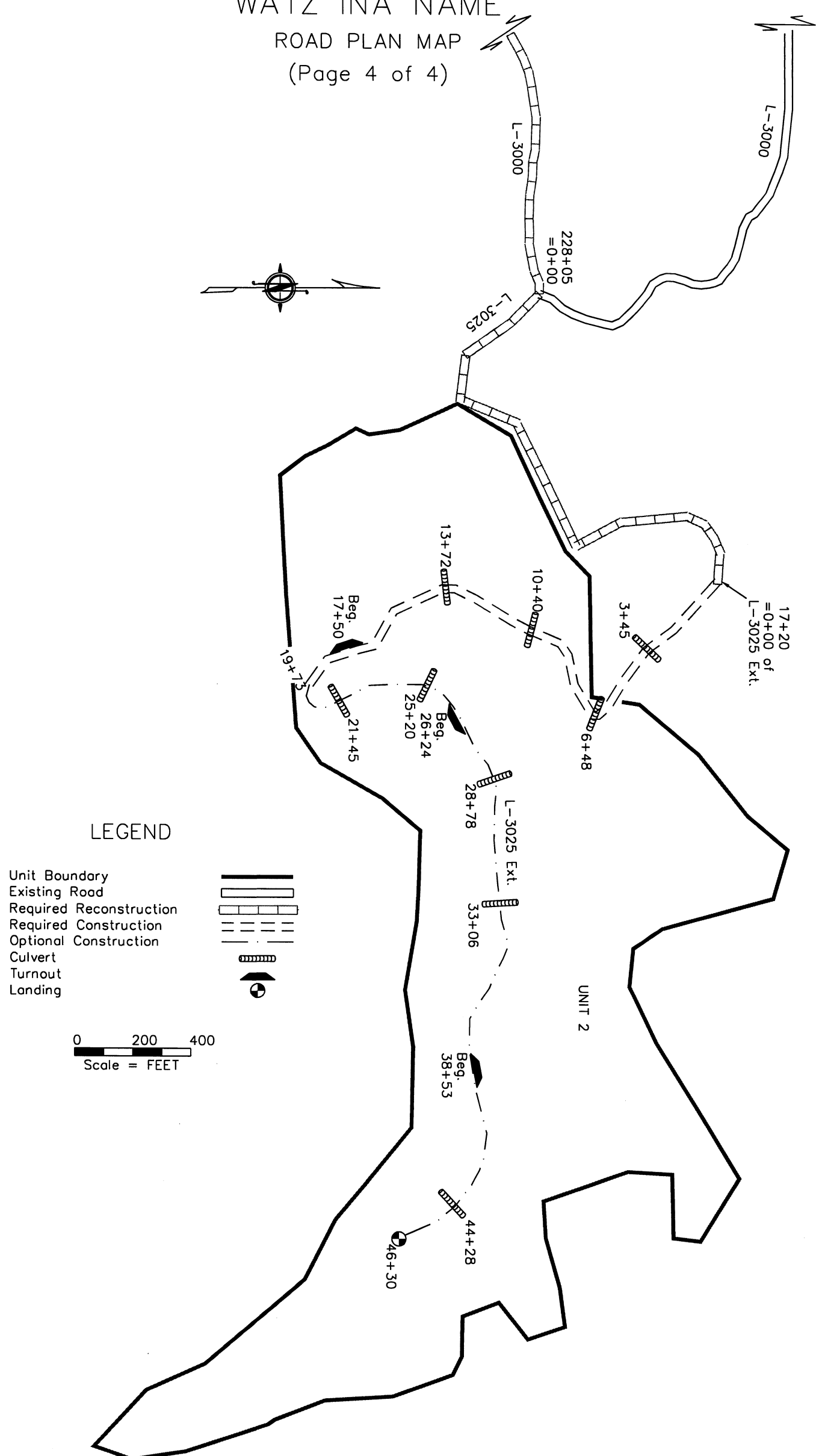
LEGEND



(Page 3 of 4)



WATZ INA NAME
ROAD PLAN MAP
(Page 4 of 4)



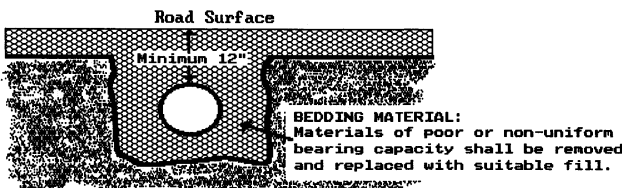
CULVERT LIST

Road Number	Location	Culvert		Length (ft)			Riprap (C.Y.)			Backfill Material	Placement Method	Const. Staked	Remarks
		Dia.	Gauge	Culvert	Downspt	Flume	Inlet	Outlet	Type				
			If Steel										
L-3008	1+37	24"	-	50	-	-	-	-	-	NT	-	-	Provided
	4+33	18"	-	30	-	-	-	-	-	NT	-	-	
L-3014.2	0+24	18"	-	34	-	-	½	½	8"	NT	-	-	
L-3016	0+39	18"	-	32	-	-	½	½	8"	NT	-	-	
	2+83	18"	-	32	-	-	½	½	8"	NT	-	-	
L-3016.1	4+43	18"	-	30	-	-	½	½	8"	NT	-	-	
L-3025 Ext.	3+45	18"	-	32	-	-	½	½	8"	NT	-	-	
	6+48	18"	-	32	-	-	½	½	8"	NT	-	-	
	10+40	18"	-	32	-	-	½	½	8"	NT	-	-	
	13+72	18"	-	32	-	-	½	½	8"	NT	-	-	
	21+45	18"	-	32	-	-	½	½	8"	NT	-	-	
	25+20	24"	-	36	-	-	½	½	8"	NT	-	-	
	28+78	18"	-	34	-	-	½	½	8"	NT	-	-	
	33+06	18"	-	32	-	-	½	½	8"	NT	-	-	
	44+28	18"	-	30	-	-	½	½	8"	NT	-	-	

Key:

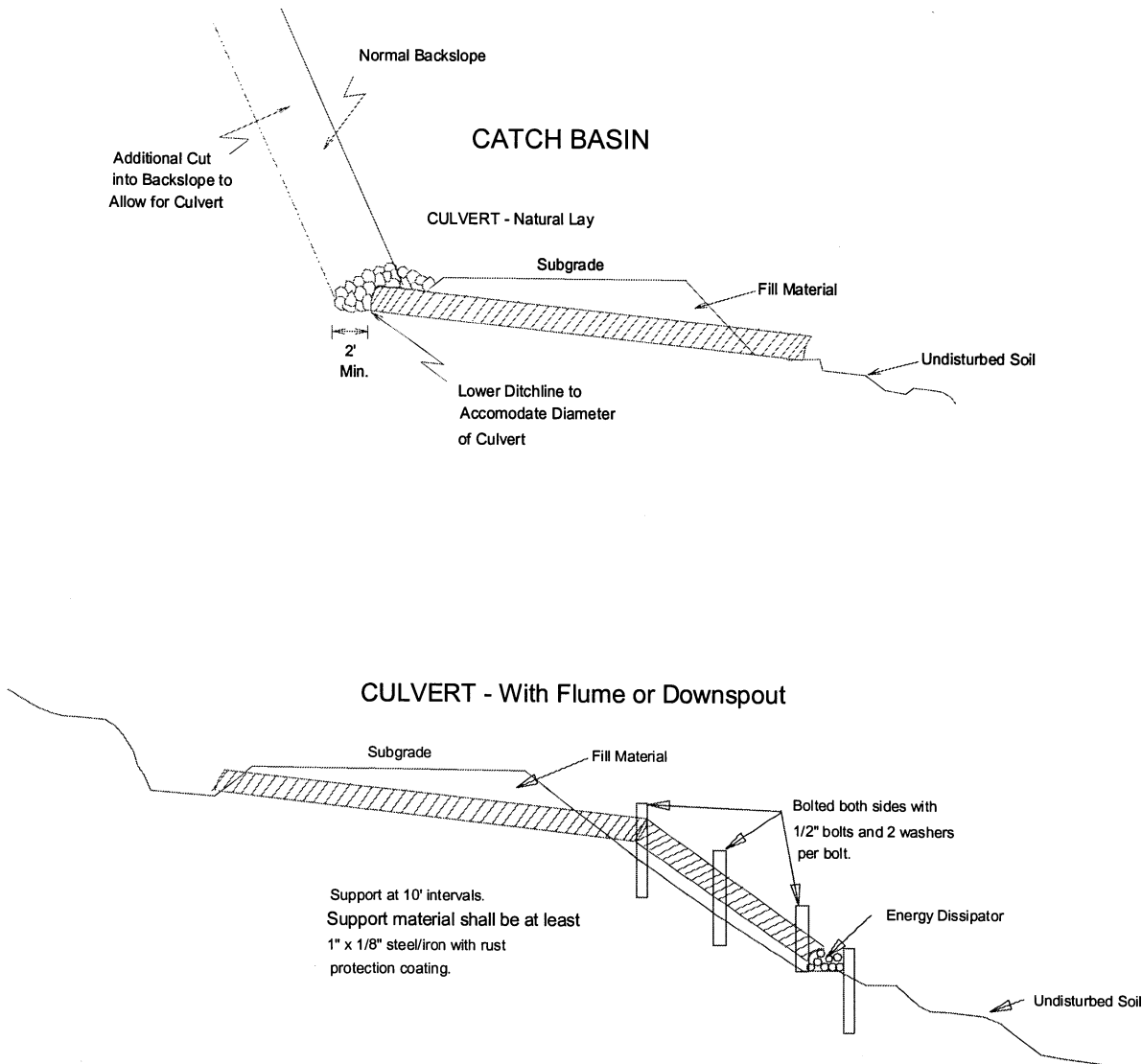
- 8" - 8 Inch Plus Rock
NT - Native (bank run)
SL - Select Fill
HL - Heavy Loose Riprap
LL - Light Loose Riprap
Flume - Half round pipe
Downspout - Full round pipe

CULVERT BACKFILL AND BASE PREPARATION (For culverts less than 36")

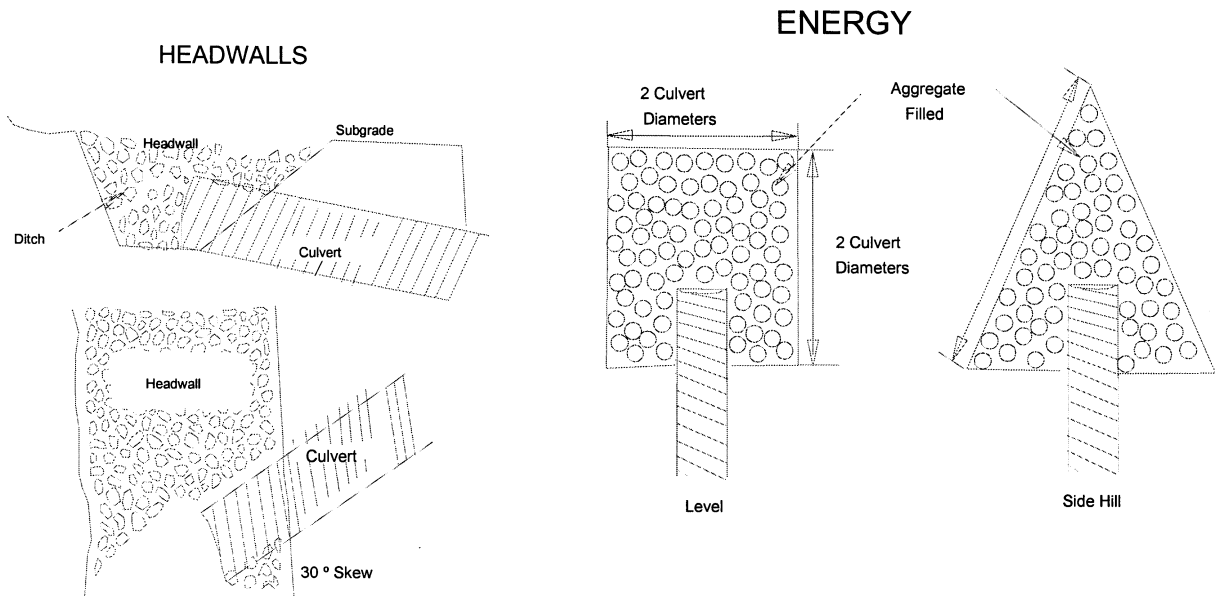


CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 1 of 2)



Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.

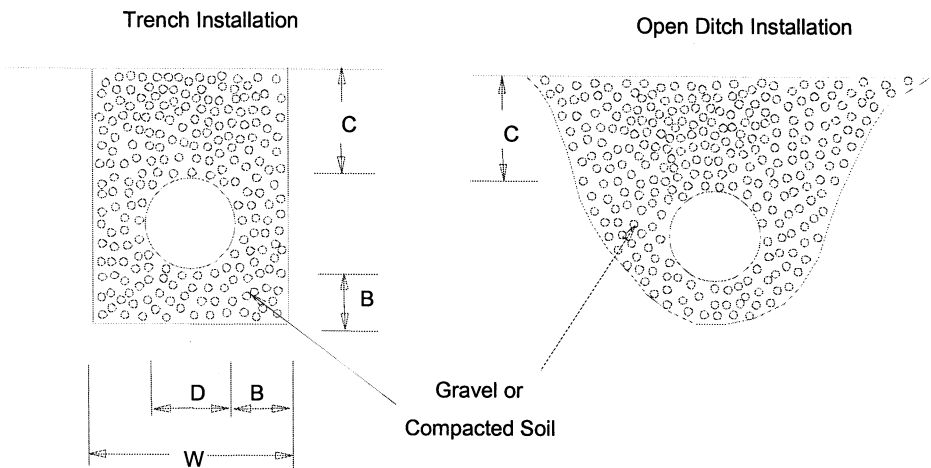
Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL
(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

- 1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.
- 2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.
- 3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.
- 4. Site conditions and availability of bedding materials often dictate the type of installation method used.
- 5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.



MINIMUM DIMENSIONS
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills

1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 1 ½:1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
3. Undesirable slide materials and debris shall not be mixed into the surface material.

B. Surface

1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
3. Watering may be required to control dust and to retain fine surface rock.
4. Desirable surface material shall not be bladed off the roadway.
5. Replace surface material lost or worn away.
6. Remove berms except as directed by the State.
7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage

1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
5. Keep silt bearing surface runoff from getting into live streams.

D. Structures

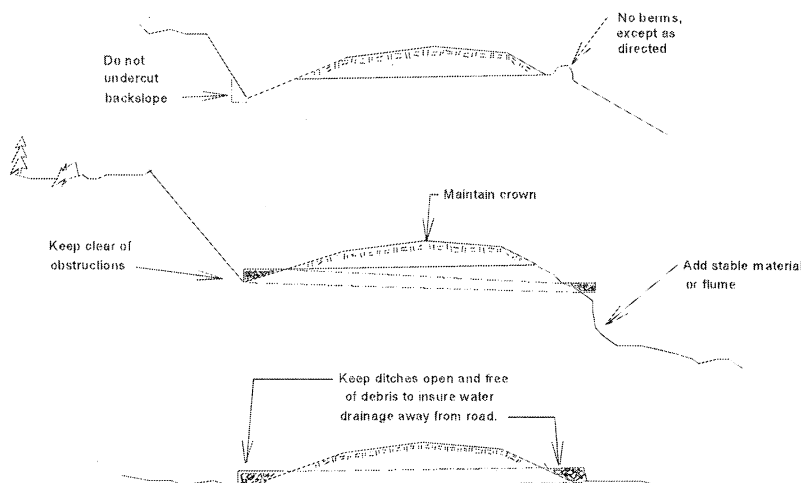
Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

E. Termination of Use or End of Season

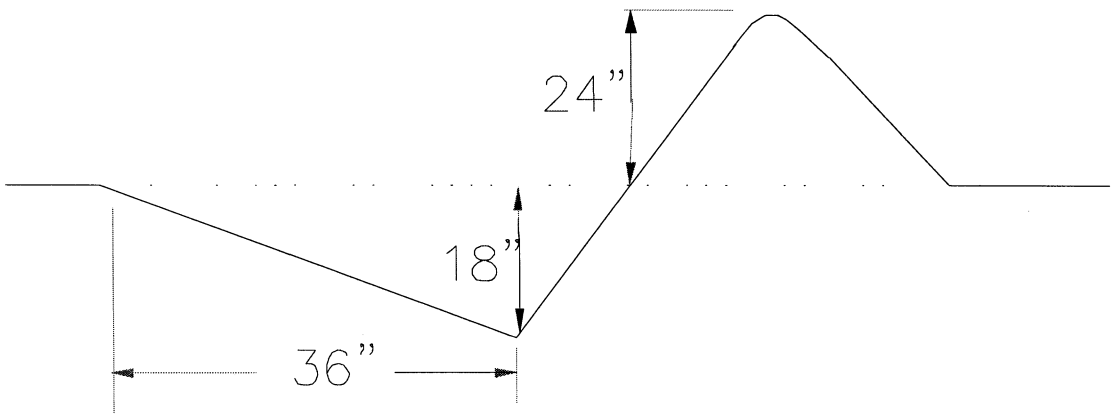
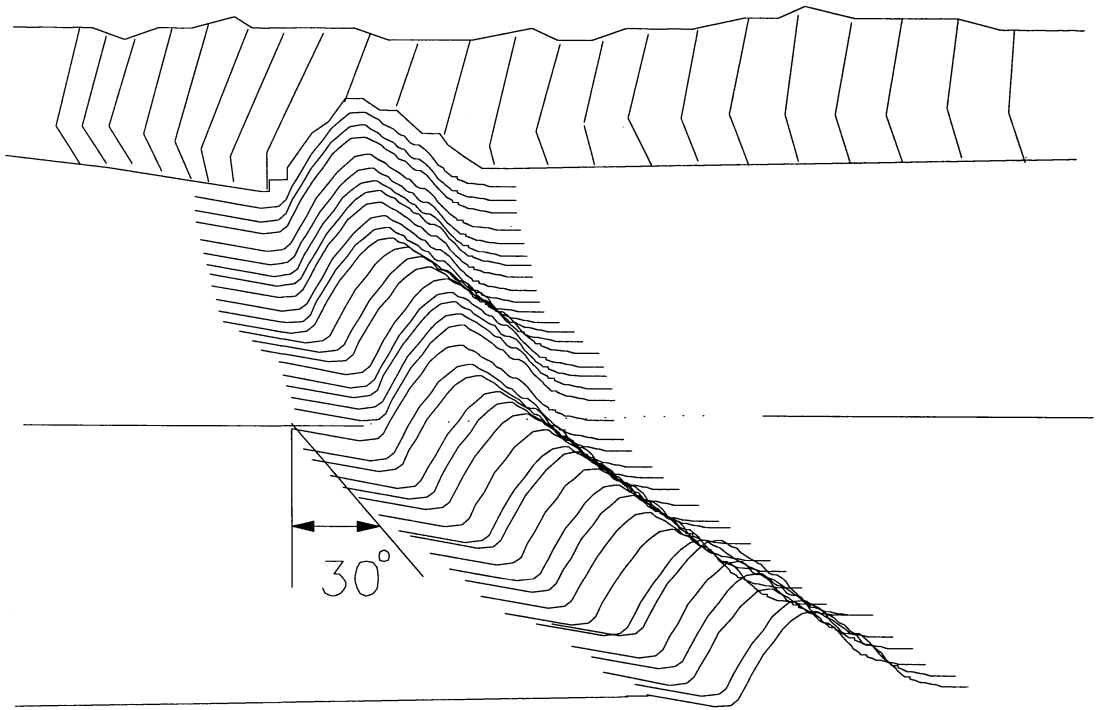
Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

F. Debris

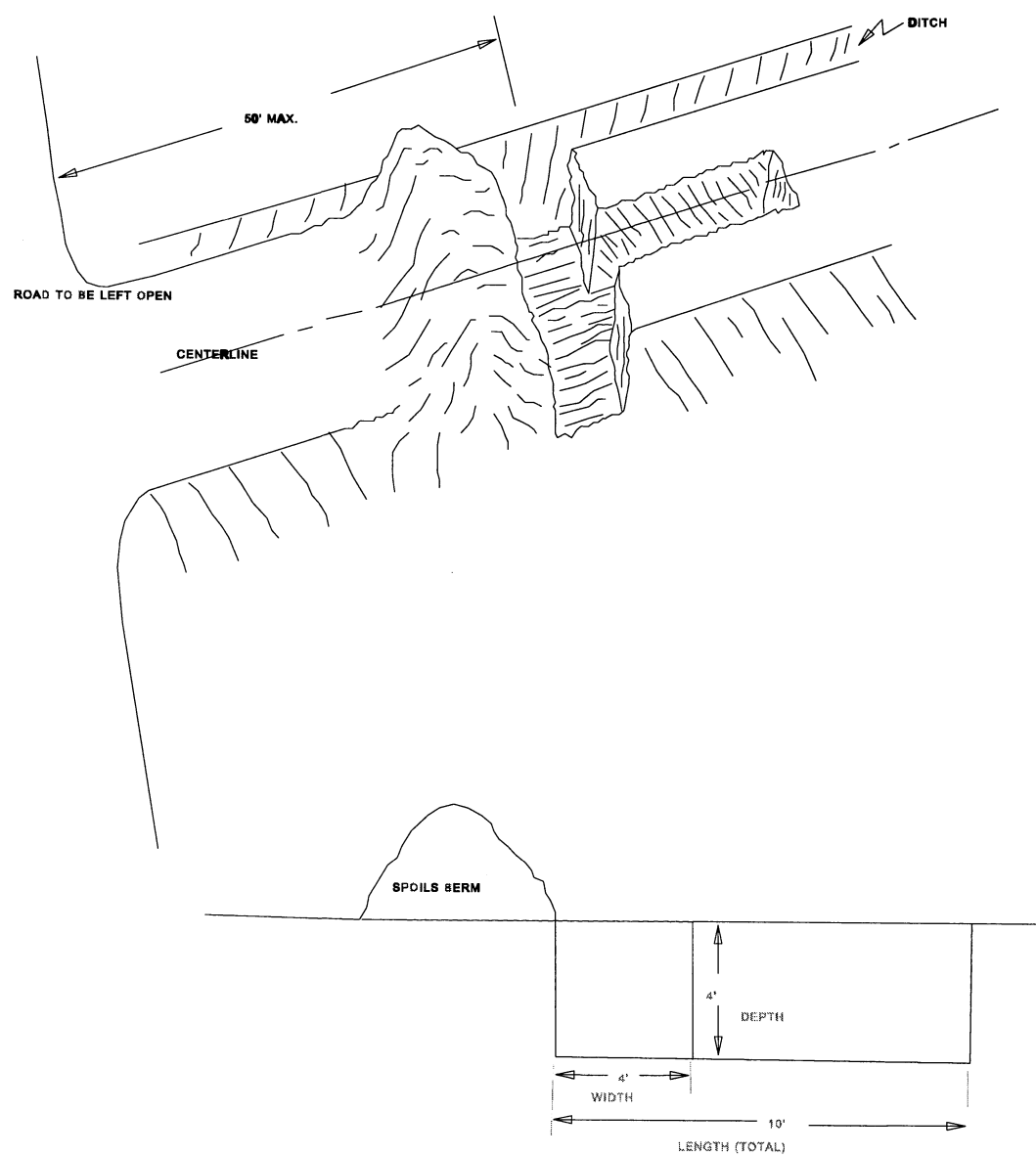
Remove fallen timber, limbs, and stumps from the slopes or roadway.



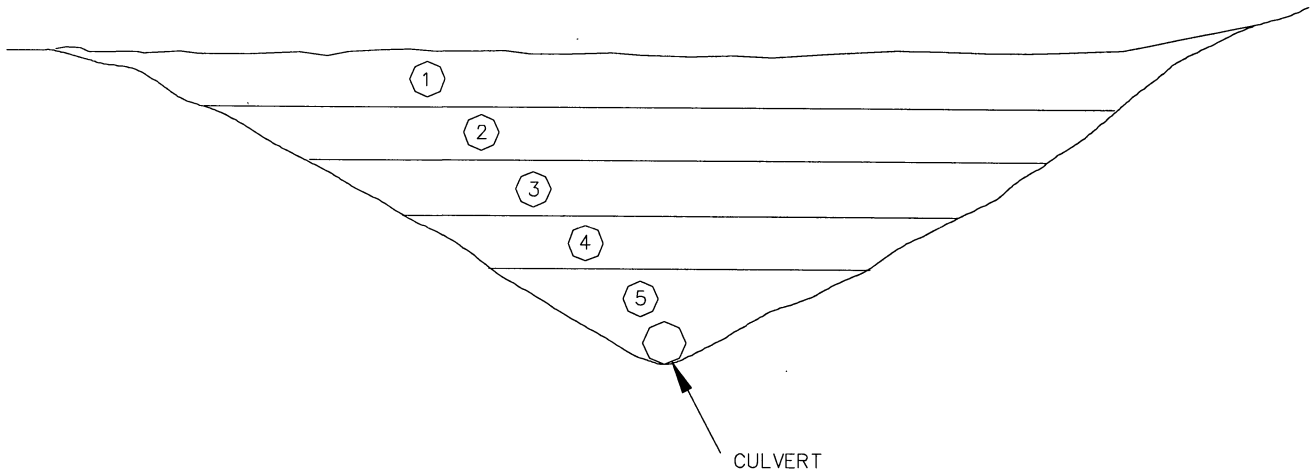
NON-DRIVABLE WATER BAR DETAIL



"T" TANK TRAP DETAIL

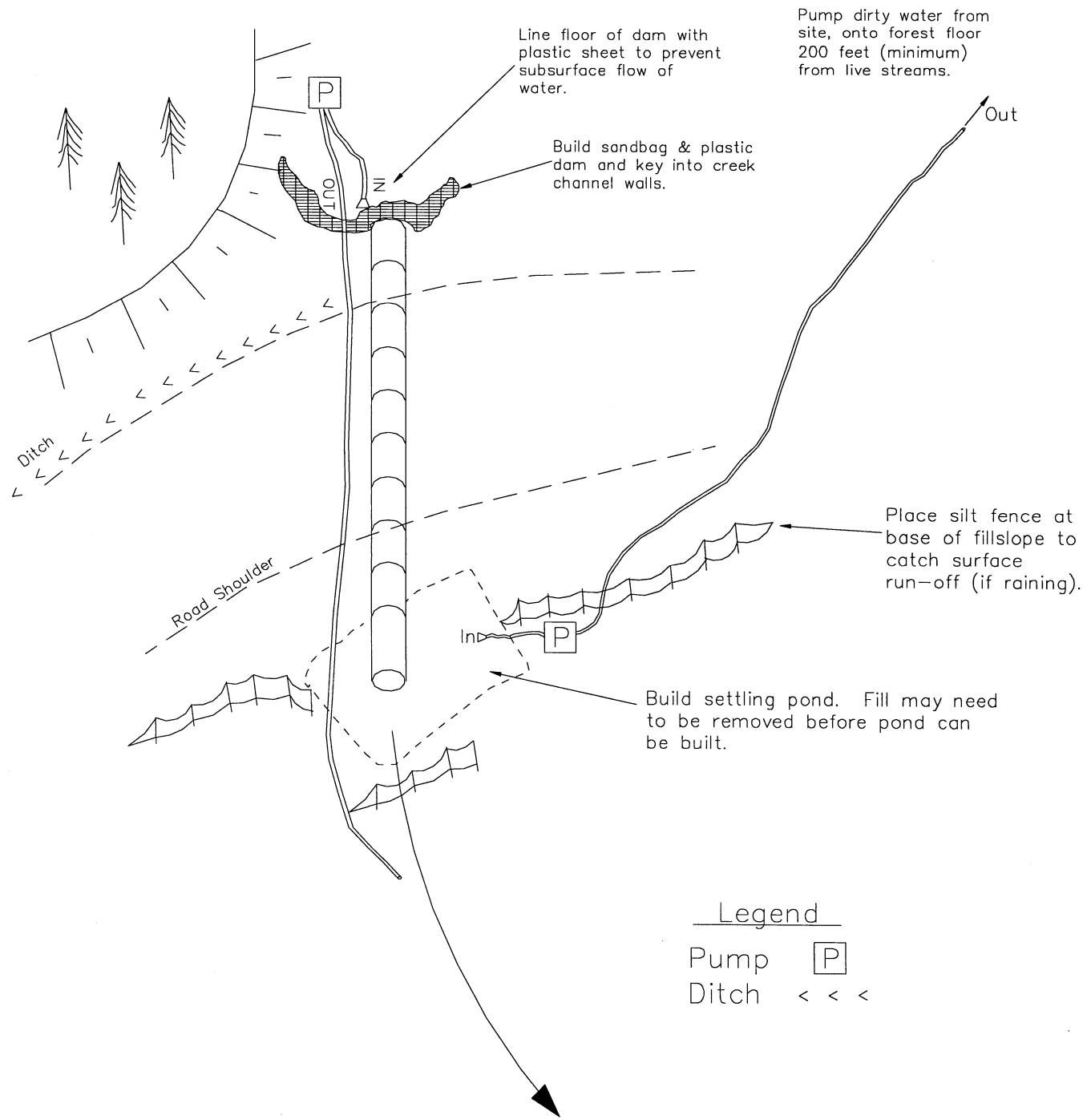


FILL REMOVAL DETAIL



- Remove fill in layers not to exceed 3 feet.
- Channel slopes shall be according to clause 10.1–7 and the Live Stream Culvert Removal Procedure

SETTLING POND AND PUMP DETAIL



LIVE STREAM CULVERT REMOVAL PROCEDURE

Order of work is as follows, deviations shall be approved, in writing, by the Contract Administrator.

- 1) Purchaser shall notify the State of intent to start project, and a pre-work conference shall be held before move in of equipment. State will designate a representative that will remain on site at all times when work is being performed in creek channel.
- 2) Assemble the items on the A Materials List@ onsite before proceeding.
- 3) Remove 95% of fill (see FILL REMOVAL DETAIL) and end haul or push to station 0+20 and 2+50 on the L-3008 road.
- 4) Set up pumps (2 required, with one as backup).
- 5) Dam up stream with sandbags and line floor of dam with plastic (to prevent sub-surface water flow), place clean rock on plastic to hold in place, and key leading edge of plastic into channel bottom - see SETTLING POND AND PUMP DETAIL. Build a settling pond at culvert outlet. Fill may need to be removed before the settling pond installation due to space limitations. Pump clean water at catch basin around work site and back into stream. Dirty water shall be pumped away from site and onto forest floor a minimum of 200 feet from live streams. Silt fence shall be erected at base of fill slope and bottom edge of fence shall be keyed into slope and held in place with rocks to prevent water from flowing under the silt fence.
- 6) Remove remainder of fill and culvert.
- 7) Backfill settling pond.
- 8) Cover exposed soils within 100 feet of all live streams with straw (minimum depth of 8 inches) and grass seed.

Materials List:

- B 2 pumps, (one as a backup) The clean water pump (dam at culvert catch basin) shall have a minimum capacity of 1200 gallons per minute. The dirty water pump (settling pond) and the backup pump shall each have a minimum capacity of 600 gpm. Culvert removal should not start during rain or threat of rain;
- B 2,000 square feet plastic sheet;
- B 200 feet of silt fence and stakes;
- B 25 bales of straw.

SUMMARY - Road Development Costs

DISTRICT: Lewis

SALE/PROJECT NAME: Watz Ina Name Timbersale

CONTRACT NUMBER: 30-076349

LEGAL DESCRIPTION: Secs 22, 23, 26, 27, 34, & 35 Town. 14 North, Rng. 05 West W.M.

ROAD NUMBER:	L-3000	L-3014, L-3015 S/F, L-3016, L-3025, L- 3025 ext. L-3008, L-3014.1, L-3014.2, L-3015.1, L-3016.1	
ROAD STANDARD:	Mainline (14' R.S.)	Secondary Mainline (12' R.S.)	Spur road (10' R.S.)
NUMBER OF STATIONS:	117.60	95.10	39.17
SIDESLOPE:	N/A	30%	30%
CLEARING AND GRUBBING:	\$0	\$11,995	\$2,778
EXCAVATION AND FILL:	\$0	\$19,566	\$2,585
ROCK TOTALS (Cu. Yds.):			
Ballast: 4880	\$0	\$16,922	\$8,503
Surface: 5546	\$35,822	\$13,870	\$0
Riprap: 13	\$0	\$35	\$6
CULVERTS AND FLUMES:	\$0	\$3,875	\$1,987
STRUCTURES:	\$0	\$0	\$0
GENERAL EXPENSES:	\$3,224	\$5,964	\$1,586
MOBILIZATION:	\$1,283	\$1,283	\$1,283
TOTAL COSTS:	\$40,329	\$73,511	\$18,728
COST PER STATION:	\$343	\$773	\$478
NOTE: This appraisal has no allowance for profit and risk.	TOTAL (All Roads) =		\$132,569
	SALE VOLUME MBF =		6,500
	TOTAL COST PER MBF =		\$20.40

Plans to be furnished by:	Compiled by: M. Miskovic	Date: 03/08/04
Plan only: STATE	Checked by:	Date:
Plan-profile:	Region Engineer:	Date:
	Div of Engr.:	Date:

REMARKS:

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Watz Ina Name Timbersale

CONTRACT NUMBER: 30-076349

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
L-3000			*Reconstruction - C & G not included				117.60	

Clear and Grub TOTAL = \$0

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
L-3000			*Reconstruction - Excavation not included				

*End Haul, Over Haul, Large Fills/Cuts

End Haul/ Over Haul
Large Fills/ Cuts

Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total

Excavation TOTAL = \$0

III. BALLAST AND SURFACING :

Ballast source (4"):

Surface source (1 1/2" minus):

8" plus source :

Quick Quarry

Quick Quarry

Quick Quarry

Description	cu.yds/sta x stations =	cubic yards
Ballast (4"-)		0
Surfacing (1 1/2"-)		3,998
8" plus		0

* Haul Formula: (R.T.Miles/MPH+Delay)(\$/hr / Cy/load)

R.T. Miles =	2.5				
Ave. Speed =	25	Ballast (4"-)	0 Cu. yds @	\$5.21 /cu. yd =	\$0
Delay (Hrs.)=	0.2	Surfacing (1 1/2"	3998 Cu. yds @	\$8.96 /cu. yd =	\$35,822
Cost / Hour =	\$77.00	8" plus	0 Cu. yds @	\$3.21 /cu. yd =	\$0
CY / Load =	24				

Rock total = \$35,822

UNIT COSTS

	Ballast	Surfacing	Riprap
Drill & Shoot		\$2.50	
Dig and load	\$1.00	\$1.00	\$1.00
Crushing	\$2.00	\$3.25	
Purchase			
Haul *	\$0.96	\$0.96	\$0.96
Spread	\$0.80	\$0.80	\$0.80
Compact	\$0.45	\$0.45	\$0.45
Strip			
Reclamation			
TOTAL (\$/cy)	\$5.21	\$8.96	\$3.21

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter	No/Length	Installed Cost/ft	Sub-total
Bands & Gaskets						

Culvert total = \$0

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total

Structure total = \$0

Sub-TOTAL = \$35,822

VI. GENERAL EXPENSES:

Overhead & General Exp. Add 9% \$3,224

VII. MOBILIZATION:

Description	\$ per Move	# of Moves	Sub-total
Dump Trucks	100	3	\$300
* Move in costs are averaged over all three sheets.			
Grader	400	1	\$400
Compactor	400	1	\$400
Excavator	450	1	\$450
Dozer D8)	400	1	\$400
Front end loader	400	1	\$400
Rock crusher	\$1,500	1	\$1,500
Dozer (D5)	\$240	0	\$0

Total Mobilization = \$3,850

Mobilization sub-total = \$1,283

Road No. L-3000

Standard: Mainline (14' R.S.)

Stations: 117.60

SHEET TOTAL = \$40,329

By: M. Miskovic

Sheet 2 of 4

Date: 03/08/04

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Watz Ina Name Timbersale					CONTRACT NUMBER: 30-076349																																															
I. CLEARING AND GRUBBING:																																																				
Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total																																												
L-3014, L-3025			*Reconstruction - C & G not included				25.20	\$0																																												
L-3015 S/F, L-3016, L-3025 ext.	40%	35	1.00	4.29	\$40	1.00	69.90	\$11,995																																												
							Clear and Grub TOTAL =	\$11,995																																												
II. EXCAVATION:																																																				
Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total																																													
L-3014, L-3016, & L-3025		*Reconstruction - Excavation not included				46.34	\$0																																													
L-3015 S/F, L-3025 ext.	40%	1.00	4.56	\$88	1.00	48.76	\$19,566																																													
*End Haul, Over Haul, Large Fills/Cuts				Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total																																													
End Haul/ Over Haul Large Fills/ Cuts																																																				
							Excavation TOTAL =	\$19,566																																												
III. BALLAST AND SURFACING :																																																				
Ballast source (4"):	Quick Quarry	<table><tr><td>UNIT COSTS</td><td>Ballast</td><td>Surfacing</td><td>Riprap</td></tr><tr><td>Drill & Shoot</td><td></td><td>\$2.50</td><td></td></tr><tr><td>Dig and load</td><td>\$1.00</td><td>\$1.00</td><td>\$1.00</td></tr><tr><td>Crushing</td><td>\$2.00</td><td>\$3.25</td><td></td></tr><tr><td>Purchase</td><td></td><td></td><td></td></tr><tr><td>Haul *</td><td>\$0.96</td><td>\$0.96</td><td>\$0.96</td></tr><tr><td>Spread</td><td>\$0.80</td><td>\$0.80</td><td>\$0.80</td></tr><tr><td>Compact</td><td>\$0.45</td><td>\$0.45</td><td>\$0.45</td></tr><tr><td>Strip</td><td></td><td></td><td></td></tr><tr><td>Reclamation</td><td></td><td></td><td></td></tr><tr><td>TOTAL (\$/cy)</td><td>\$5.21</td><td>\$8.96</td><td>\$3.21</td></tr></table>							UNIT COSTS	Ballast	Surfacing	Riprap	Drill & Shoot		\$2.50		Dig and load	\$1.00	\$1.00	\$1.00	Crushing	\$2.00	\$3.25		Purchase				Haul *	\$0.96	\$0.96	\$0.96	Spread	\$0.80	\$0.80	\$0.80	Compact	\$0.45	\$0.45	\$0.45	Strip				Reclamation				TOTAL (\$/cy)	\$5.21	\$8.96	\$3.21
UNIT COSTS	Ballast								Surfacing	Riprap																																										
Drill & Shoot									\$2.50																																											
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Haul *	\$0.96	\$0.96	\$0.96																																																	
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Strip																																																				
Reclamation																																																				
TOTAL (\$/cy)	\$5.21	\$8.96	\$3.21																																																	
Surface source (1 1/2" minus):	Quick Quarry																																																			
8" plus source :	Quick Quarry																																																			
Description	cu.yds/sta x stations = cubic yards																																																			
Ballast (4"-)	3,248																																																			
Surfacing (1 1/2"-)	1,548																																																			
8" plus	11																																																			
* Haul Formula: (R.T.Miles/MPH+Delay)(\$/hr / Cy/load)																																																				
R.T. Miles =	2.5																																																			
Ave. Speed =	25.0	Ballast (4"-)	3248	Cu. yds @	\$5.21 /cu. yd =		\$16,922																																													
Delay (Hrs.)=	0.2	Surfacing (1 1/2"	1548	Cu. yds @	\$8.96 /cu. yd =		\$13,870																																													
Cost / Hour =	77.0	8" plus	11	Cu. yds @	\$3.21 /cu. yd =		\$35																																													
CY / Load =	24.0																																																			
							Rock total =	\$30,827																																												
IV. CULVERTS AND FLUMES:																																																				
Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total																																														
	1	na	18	30	\$11.80	\$354																																														
	8	na	18	32	\$11.80	\$3,021																																														
	1	na	18	34	\$11.80	\$401																																														
Bands & Gaskets		10 - 18" bands @ \$9.90ea				\$99																																														
							Culvert total =	\$3,875																																												
V. STRUCTURES																																																				
Description	Type	Width	Length	Cost/ft.	Sub-total																																															
						Structure total =	\$0																																													
						Sub-TOTAL =	\$66,264																																													
VI. GENERAL EXPENSES:																																																				
Overhead & General Exp. Add						9%	\$5,964																																													
VII. MOBILIZATION:																																																				
Description	\$ per Move	# of Moves	Sub-total																																																	
Dump Trucks	\$100	3	\$300																																																	
* Move in costs	\$400	1	\$400																																																	
are averaged over	\$400	1	\$400																																																	
all three sheets.	\$450	1	\$450																																																	
	\$400	1	\$400																																																	
	\$400	1	\$400																																																	
	\$1,500	1	\$1,500																																																	
	\$240	0	\$0																																																	
Total Mobilization =			\$3,850	Mobilization sub-total =	\$1,283																																															
Road No.	L-3014, L-3015 S/F, L-3016, L-3025, L-3025 ext.																																																			
Standard:	Secondary Mainline (12' R.S.)																																																			
Stations:	95.10																																																			
							SHEET TOTAL =	\$73,511																																												
By: M. Miskovic			Sheet 3 of 4			Date: 03/08/04																																														

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Watz Ina Name Timbersale

CONTRACT NUMBER: 30-076349

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
L-3008, L-3014.1, L-3014.2, L-3015.1, L-3016.1	20%	35	1.00	2.77	\$32	0.80	39.17	\$2,778

Clear and Grub TOTAL = \$2,778

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
L-3008, L-3014.1, L-3014.2, L-3015.1, L-3016.1	20%	1.00	2.00	\$66	0.50	39.17	\$2,585

*End Haul, Over Haul, Large Fills/Cuts

End Haul/ Over Haul Large Fills/ Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
---------------------------------------	---------------------	--------------------	----------	-----------

Excavation TOTAL = \$2,585

III. BALLAST AND SURFACING :

Ballast source (4"):

Surface source (1 1/2" minus):

8" plus source :

Quick Quarry

Quick Quarry

Quick Quarry

Description	cu.yds/sta x stations =	cubic yards
Ballast (4"-)		1,632
Surfacing (1 1/2"-)		0
8" plus		2

* Haul Formula: (R.T.Miles/MPH+Delay)/(\$/hr / Cy/load)

UNIT COSTS	Ballast	Surfacing	Riprap
Drill & Shoot		\$2.50	
Dig and load	\$1.00	\$1.00	\$1.00
Crushing	\$2.00	\$3.25	
Purchase			
Haul *	\$0.96	\$0.96	\$0.96
Spread	\$0.80	\$0.80	\$0.80
Compact	\$0.45	\$0.45	\$0.45
Strip			
Reclamation			
TOTAL (\$/cy)	\$5.21	\$8.96	\$3.21

R.T. Miles = 2.5

Ave. Speed = 25.0

Delay (Hrs.)= 0.2

Cost / Hour = 77.0

CY / Load = 24.0

Ballast (4"-) 1632 Cu. yds @ \$5.21 /cu. yd = \$8,503

Surfacing (1 1/2 0 Cu. yds @ \$8.96 /cu. yd = \$0

8" plus 2 Cu. yds @ \$3.21 /cu. yd = \$6

Rock total = \$8,509

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
	2	N/A	18	30	\$11.80	\$708
	1	N/A	18	34	\$11.80	\$401
	1	14	24	50	\$16.70	\$835

Bands & Gaskets

3 - 18" bands @ \$9.90ea

1 - 24" band @ \$13.20 each

\$30

\$13

Culvert total = \$1,987

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
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Structure total = \$0

Sub-TOTAL = \$15,859

VI. GENERAL EXPENSES:

Overhead & General Exp. Add 10% \$1,586

VII. MOBILIZATION:

Description	\$ per Move	# of Moves	Sub-total
Dump Trucks	100	3	\$300
* Move in costs	400	1	\$400
are averaged over	400	1	\$400
all three sheets.	450	1	\$450
	400	1	\$400
	400	1	\$400
	\$1,500	1	\$1,500
	\$240	0	\$0

Total Mobilization = \$3,850

Mobilization sub-total = \$1,283

Road No. L-3014, L-3015 S/F, L-3016, L-3025, L-3025 ext.

Standard: Secondary Mainline (12' R.S.)

Stations: 0.00

SHEET TOTAL = \$18,728

By: M. Miskovic

Sheet 4 of 4

Date: 03/08/04